Arctic Ice Demonstration

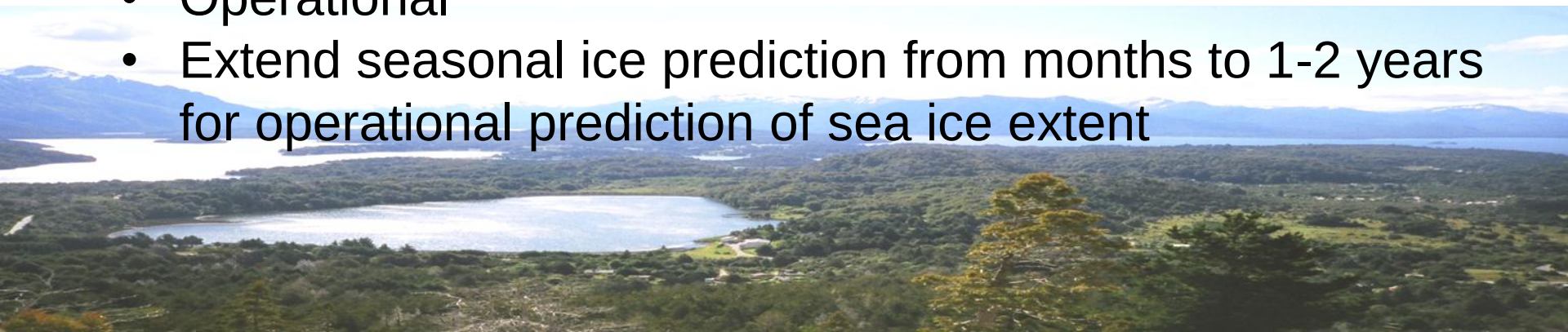
Choose one of the following:

Decadal scales (original)

- Determine when Arctic (esp. NW passage) is likely to be ice free for X weeks/months and remain so for at least Y years
- Emphasis on earliest possible and most likely dates with quantitative confidence estimates
- Continuous running decadal prediction

Interannual

- Operational
- Extend seasonal ice prediction from months to 1-2 years for operational prediction of sea ice extent



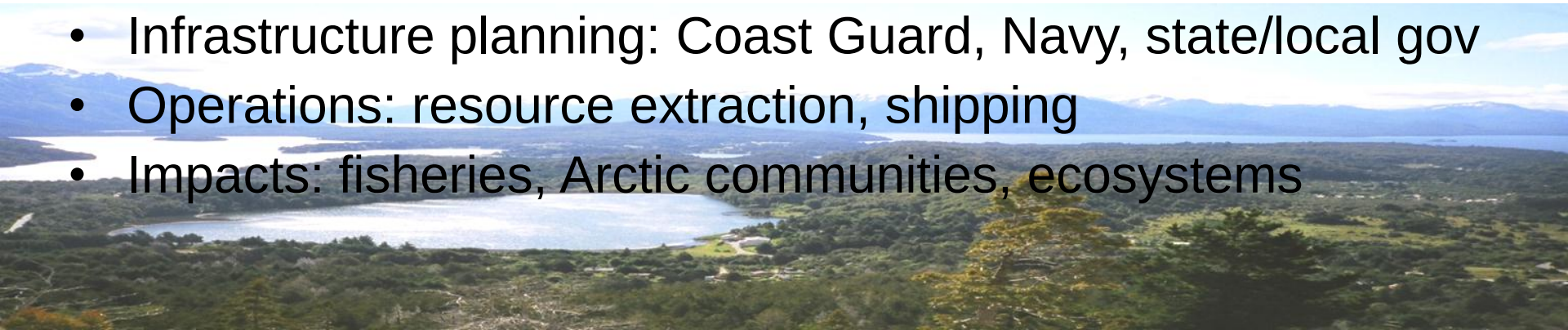
Decadal

Goals (to be refined/redefined by science team):

- Determine range of dates for which “operations” in the Arctic (esp NW passage) could become feasible (e.g. ice free for X weeks and remain so for Y years) and supply quantitative confidence measure
- Improve decadal predictability of sea ice extent
- Reduce range of projection and increase confidence
- Explore sensitivity to decadal modes (e.g. AO/NAO)
- Continue to supply running decadal forecast to further refine

Potential Users:

- Infrastructure planning: Coast Guard, Navy, state/local gov
- Operations: resource extraction, shipping
- Impacts: fisheries, Arctic communities, ecosystems



Decadal

Science Team:

- Reps from IPCC modeling groups: CESM (Holland, Hunke), GFDL (Winton), GISS(?)
- Academic centers: NPS (Maslowski), IARC/UAF (Watanabe), U. Washington (Bitz, Zhang), other AOMIP participants
- Users: Navy initially, Later include industry, state/local

Baseline

- Revisit current projections in new AR5 results
- Do new AR5 decadal prediction sims narrow range of ice extent projections?
- What are the limiters?

Decadal

Framework

- Analysis of AR5 results
- Multi-model ensembles
- UQ for confidence estimate
- Further refine, rerun projections, decadal predictions

Resources:

- AR5 data from ESGF
- Potentially significant resources if re-run decadal projections or increase AR5 ensemble size

Interannual

Goals (to be refined/redefined by science team):

- Extend ice extent prediction from seasonal to annual/interannual
- Improve operational framework

Potential Users:

- Operations: Coast Guard, Navy, shipping, resource extraction, Arctic communities

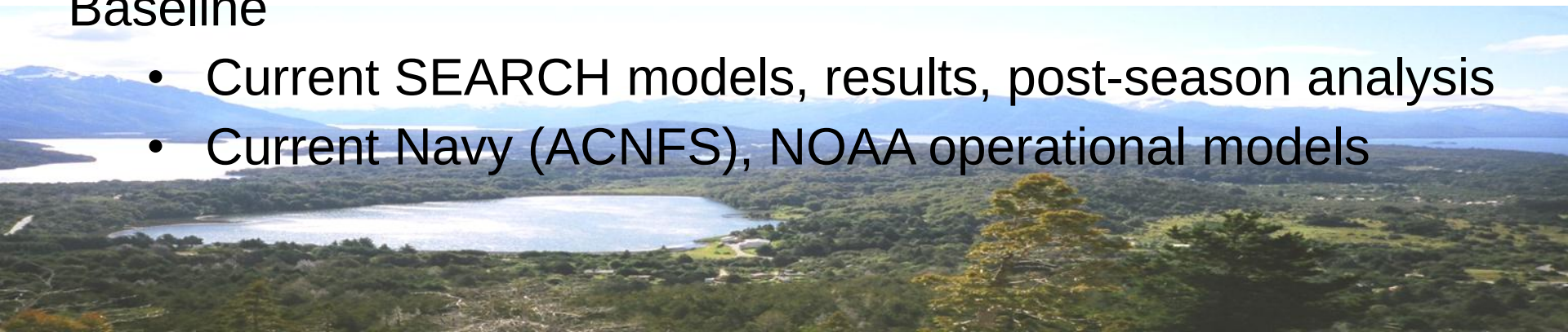
Interannual

Science Team:

- SEARCH:
  - PIOMAS (U. Washington – Zhang, also Bitz)
  - NSIDC (Meier, Stroeve, Serreze)
  - IARC?
  - NCAR (Holland)
  - NOAA/PMEL (Overland)
- NRL Stennis: ACNFS (?)
- National Ice Center (Navy/NOAA/CG) ARIFS: Arbetter

Baseline

- Current SEARCH models, results, post-season analysis
- Current Navy (ACNFS), NOAA operational models



Interannual

Framework

- Multi-model or single operational?
- Data repository for assimilated data

Resources:

- Dedicated (or at least high availability) computational resources for operational prediction
- Storage resources for assimilated data
- Access to obs for assimilation